IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.: 10/543,019

Filed: December 22, 2005

Inventor: Norishige Kawaguchi et al.

Art Unit: 1791

Examiner: Jodi F. Cohen

Title: Method of Manufacturing Polyolefin-Polyamide Resin Composition

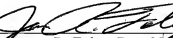
Conf. No.: 3950

APPLICANT'S APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

UBE INDUSTRIES, LTD.

Date: April 16, 2010

By: 

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I. REAL PARTY IN INTEREST.

The real party in interest is Applicant, UBE INDUSTRIES, LTD., a corporation organized and existing under the laws of Japan, having its principal place of business at 1978-96, Oaza Kogushi, Ube-shi, Yamaguchi 755-8633, Japan. Applicant is the owner of the application by virtue of an Assignment from the inventors. The Assignment is recorded at Reel 016437, Frame 0615.

II. RELATED APPEALS AND INTERFERENCES.

Applicant and Applicant's undersigned legal representative know of no related appeals, interferences, or judicial proceedings which may be related to, directly affect, or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF CLAIMS.

Claims 1 through 4 are pending in the application. All pending claims have been rejected at least twice. Applicant appeals the rejection of claims 1 through 4. All pending claims stand or fall with claim 1.

IV. STATUS OF AMENDMENTS.

No amendments have been filed subsequent to the rejection in the final Office Action mailed November 16, 2009.

V. SUMMARY OF CLAIMED SUBJECT MATTER.

A. Independent claim 1:

Independent claim 1 claims a method of manufacturing polyolefin-polyamide resin composition:

A method of manufacturing polyolefin-polyamide resin composition:

The Field of Invention section of the specification states that the present invention relates to a method of manufacturing polyolefin-polyamide resin composition. Page 1, lines 5-6. The Detailed Description of the Invention describes a method of manufacturing polyolefin-polyamide resin compositions. Page 3, lines 34-35.

melting and kneading, extruding, and drafted drawing or rolling

The preferred method of manufacture has first, second, and third steps of melting and kneading. Page 9, lines 5, 9, and 12. The fourth step is drafted drawing or rolling. Page 9, line 15-16. See also page 9, lines 3-21.

(a) a polyolefin,

Component (a) is described as a polyolefin. Page 3, lines 35-36. Specific examples of polyolefins are described from page 3, line 35 to page 5, line 3.

(b) a polyamide,

Component (b) is described as a polyamide. Page 5, line 4. Specific examples of polyamides are described from page 5, line 10 to page 6, line 5.

(c) a silane coupling agent,

Component (c) is described as a silane coupling agent. Page 6, line 6. Specific examples of silane coupling agents are described from page 6, lines 6-24.

(d) a first antioxidant with a melting point of 70-170 °C,

Component (d) is described as an antioxidant with a melting point of 70 to 170 °C. Page 7, lines 32-33. Specific examples are described from page 7, line 33 to page 8, line 8.

(e) a second antioxidant with a melting point of 180-300 °C

Component (e) is described as an antioxidant with a melting point of 180 to 300 °C. Page 8, lines 9-10. Specific examples are given from page 8, lines 11-24.

to disperse the polyamide (b) in the form of fiber

This limitation is described at page 9, line 34 to page 10, line 5, at page 10, lines 13-18, and at page 11, lines 2-6.

with an average fiber diameter of 1 μm or less in the polyolefin (a) to finish the composition in the form of pellets,

This goal is described at page 2, lines 24-26 and at page 3, lines 22-24.

wherein the melting point of said polyamide (b) falls within 160-265 °C.

This limitation is described at page 5, line 8.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

Whether claims 1 through 4 are unpatentable under Section 103(a) as obvious over Yamamoto JP 11-106570 and further in view of United States Patent No. 6,596,198 to Semen.

VII. ARGUMENT.

A. Introduction.

Applicant claims a method of manufacturing a manufacturing polyolefin-polyamide resin composition. The Examiner rejected the claims under Section 103(a), citing Japanese Patent Nos. 11-106570 (Yamamoto) and further in view of United States Patent No. 6,596,198 to Semen. The Examiner concluded that Yamamoto disclosed all the steps of the method except adding a first antioxidant with a melting point of 70 to 170 °C and a second antioxidant with a melting point of 180 to 300 °C. In the view of the Examiner, a person of skill in the art would have included an antioxidant additive as taught by Semen in the polyolefin polymer as taught by Yamamoto.

Applicant respectfully requests reconsideration of this conclusion. This conclusion contradicts the Supreme Court's ruling in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

B. The art is unpredictable.

Applicant has previously established that the selection of materials to manufacture a polyolefin-polyamide resin is not predictable. See Declaration of Norishige Kawaguchi, submitted in this application on March 24, 2009, at paragraph 10. Applicant notes that the Examiner did not dispute this conclusion in the ensuing Office Action. The Examiner did dispute this conclusion in the next following Office Action and in Advisory Action, but merely rejected the facts set forth in the Declaration. The Examiner provided no citation to evidence or prior art to support the disagreement. Accordingly, the unpredictability as sworn to by Mr. Kawaguchi is established.

Additionally, the unpredictability of this art is demonstrated by the examples described in the specification of the present application. Applicant describes two examples plus a

comparative example. See specification at pages 11-15. In the first two examples, two antioxidants (components (d) and (e)) are used. In the comparative example, a single antioxidant (component (e) is used. The results, as shown in Table 1, pages 13-14, are demonstrably better for the two examples than for the comparative example. Yet, there is no intuitive reason why using 0.5 weight parts of a first antioxidant and 0.5 weight parts of a second antioxidant would produce better results than using 1.0 weight part of the first antioxidant.

Thus, although the Examiner states in the Advisory Action that one of skill in the art knows that viscosity is temperature dependent, merely selecting an antioxidant does not solve the problem, as shown by the comparative example cited in the specification. Additionally, although the Examiner states in the Advisory Action that "there are a finite number of identified predictable solutions", this statement is contradicted by Semen itself. Semen provides examples of "phosphate antioxidants, sterically hindered phenol antioxidants, hindered amine UV light stabilizers, and combinations thereof." Semen at column 4, lines 13-16. Semen then goes on to provide pages and pages of examples. Certainly, some of the examples provided by Semen are outside the melting point ranges discovered by the inventors of the present application, but Semen does not teach the melting point ranges claimed in the present application so the skilled user would have to try them all. The Examiner's conclusion, then, is contrary to the Federal Circuit's opinion in *Eli Lilly & Co. v. Zenith Goldline Pharmaceuticals, Inc.*, 471 F.3d 1369 (Fed. Cir. 2006). In that case, the cited prior-art reference made a broad generic disclosure and the number of compounds disclosed, including all alternative substituents, numbered in the millions. The Court concluded, therefore, that there was no anticipation.

Similarly, in the present case, there are a vast number of antioxidants listed. But since Semen suggests "combinations thereof", a person of skill in the art would have to try

combinations of two, combinations of three, combinations of four, etc., which would add up rapidly to an impossible amount. Many, if not most, of the combinations of antioxidants described in Semen would produce negative effects undesirable for the invention of the present invention. Semen, then, under the rule of the *Eli Lilly* case, does not teach Applicant's claim to the use of two antioxidants in different, specific melting point ranges and Semen, in fact, teaches that the art is unpredictable.

C. Market forces would point a skilled user away from Semen.

Since the final rejection was based on Section 103(a) and involves a combination of references, the validity of that rejection must be examined in light of the United States Supreme Court's ruling in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). The Court noted in that case that when there is a design need or market pressure to solve a problem and there are finite numbers of identified, predictable solutions, a person of ordinary skill has good reason to pursue known options within his or her technical grasp.

The Examiner concluded that it would have been obvious for a skilled user to try the solution described in Semen. But *KSR* relied on design need or market pressure, and therefore mandates that the Office consider a common-sense consideration of market forces when assessing the obviousness of a given prior art combination. It is axiomatic, of course, that there is no more fundamental market force than to be competitive. Indeed, "competition" defines the modern "market." To be competitive, in the context of the present matter, is to offer a product that can be made more efficiently, with less downtime to the equipment.

In the present matter, however, Semen is a distinctly non-competitive offering. Semen does refer to numerous antioxidants (although Semen does not suggest the combination of two antioxidants as claimed in the present matter). Semen recognizes, however, in the context of the

problems that the inventor was trying to solve and for the materials being made, that increased temperatures caused by shear forces can cause the stabilizer, such as an antioxidant, to melt and fuse in the pellet mill, preventing the production of pellets. See Semen at column 1, lines 41-43. Semen solves this problem by addition of yet another material: "In order to avoid melting and fusing of the stabilizer in the pellet material, fatty acids, fatty alcohols, and/or their derivatives (sometimes collectively called "fatty acids") having a relatively low melting point are added to the stabilizer. Certain fatty acids also function as mold release agents during polymer part forming processes, such as injection molding, thermoforming, and the like." See column 1, lines 43-49.

Accordingly, Semen describes a method that is unduly complex as compared to numerous other prior art offerings that are available to the skilled artisan. Such complexity, in turn, leads inexorably to increased cost of design and manufacture as well as reduced reliability and increased maintenance costs. Additional raw materials are necessary (fatty acids), additional material handling is necessary, additional mixing equipment is necessary. Being aware of such market forces, and employing good common sense as suggested by the Supreme Court in *KSR*, the skilled artisan will therefore have no reason to pursue consideration of the teachings of Semen. The Supreme Court's admonitions in *KSR* therefore clearly compel a conclusion that an obviousness finding cannot be fairly based upon a combination of Semen with Yamamoto.

This conclusion is perfectly in line with the Office's EXAMINATION GUIDELINES FOR DETERMINING OBVIOUSNESS UNDER 35 U.S.C. 103 IN VIEW OF THE SUPREME COURT DECISION IN *KSR INTERNATIONAL CO. V. TELEFLEX INC.*, 72 Fed. Reg. 57526. The Office recognizes that design incentives or other market forces could have prompted one of ordinary skill in the art to vary the prior art in a predictable manner to result in the claimed invention. *Id.* at 57533, Section

F. Please note that one may not use Semen's teachings as described by Semen to arrive at the present invention, since Semen did not propose the actual combination of antioxidants claimed in the present application. Rather, one must vary Semen's teachings. But, design incentives or other market forces could not have prompted one of ordinary skill in the art to vary Semen in a predictable manner, because the art is itself unpredictable.

First of all, design incentives and market forces would not have prompted the skilled user to consider Semen, because Semen offers an unduly complex and expensive solution. Moreover, it is established in this matter that the art is unpredictable. The skilled user would not have been prompted to vary Semen in a predictable manner, because the art is unpredictable.

D. A skilled user would not have looked at the process for manufacturing a different material when the art is unpredictable.

The combination of Semen with Yamamoto is improper because Semen addresses a different composition. The present application is clearly and distinctly directed to a method of manufacturing a polyolefin-polyamide resin composition. Semen is directed to a polyolefin. Given the unpredictability of the art, there is no good reason to conclude that a skilled user, looking to manufacture a polyolefin-polyamide resin, would have considered Semen. The Examiner offers no good reason why a skilled user, looking to manufacture a polyolefin-polyamide resin, would consider antioxidants used in a polyolefin resin.

As noted by the Federal Circuit, obviousness under KSR is determined by the subject matter as a whole, not by separate pieces of the claim. *Sanofi-Synthelabo, Inc. v. Apotex, Inc.*, 550 F.3d 1075, 1086 (Fed. Cir. 2008). Accordingly, "[f]or chemical compounds, the structure of the compound and its properties are inseparable considerations in the obviousness determination." *Id.* This same reasoning applies to chemical compositions. In the present

matter, the Examiner chose to look at a separate piece of the claim, the polyolefin. But the composition being manufactured is not just a polyolefin, it is a polyolefin-polyamide composition. Semen, applying merely to a polyolefin, would not be considered by a skilled user.

A similar conclusion was reached in *Ex parte Warren*, No. 2008-3108, 2008 WL 3874499 (Bd. Pat. App. & Int. August 19, 2008). The Board concluded in that case that "substituting the prior art elements would have yielded results that were not predictable." *Id.* at *4. Additionally, the Board noted that the substitution was not simple: "The substitution would not be simply of one known element for another to obtain predictable results." *Id.*

Similarly, in the present case, a skilled user cannot simply substitute one element of Semen to obtain predictable results. *Warren* compels a conclusion that the composition as claimed in this matter is not obvious.

E. Summary regarding independent claim 1.

The combination of Yamamoto and Semen is improper. A skilled user would not have been prompted to combine the teachings of Semen with Yamamoto. The claims are therefore not obvious over the cited prior art.

F. Dependent claims.

Since the only dependent claim, claim 1, is patentable over Yamamoto and Semen, the claims dependent on claim 1, claims 2 through 4, are also patentable. Since these claims are by necessity narrower than claim 1, these claims are patentable over Yamamoto and Semen as well.

CLAIMS APPENDIX

1. A method of manufacturing polyolefin-polyamide resin composition, comprising melting and kneading, extruding, and drafted drawing or rolling (a) a polyolefin, (b) a polyamide, (c) a silane coupling agent, (d) a first antioxidant with a melting point of 70-170 °C, and (e) a second antioxidant with a melting point of 180-300 °C to disperse the polyamide (b) in the form of fiber with an average fiber diameter of 1 μm or less in the polyolefin (a) to finish the composition in the form of pellets,

wherein the melting point of said polyamide (b) falls within 160-265 °C.

2. The method of manufacturing polyolefin-polyamide resin compositions according to claim 1, comprising:

a first step of melting and kneading the polyolefin of component (a), the silane coupling agent of component (c), the first antioxidant of component (d), and the second antioxidant of component (e) for chemical modification;

a second step of melting and kneading the polyamide of component (b) at a melting point of the component (b) or higher into the component (a) chemically modified in the first step;

a third step of melting and kneading the polyamide of component (b) for chemical modification at the melting point of the component (b) or higher into the component (a) chemically modified in the first step and extruding a product;

a fourth step of drafted drawing or rolling the extruded product molten and kneaded and chemically modified in the third step, at a temperature higher than a melting point of the component (a) and lower than the melting point of the component (b); and

a step of pelletizing a composition drawn or rolled in the fourth step, by cooling down the composition to room temperature.

3. The method of manufacturing polyolefin-polyamide resin compositions according to claim 1, wherein said polyamide (b) is a thermoplastic polyamide having an amido group in the main chain.

4. The method of claim 1, wherein said polyolefin is a polyethylene.

VIII. EVIDENCE APPENDIX

The Declaration of Norishige Kawaguchi is attached. This Declaration was submitted on March 24, 2009. In the next Office Action, mailed on May 27, 2009, the Examiner asserted a new ground of rejection and therefore did not respond to this Declaration. The Examiner responded to this Declaration in the Office Action mailed November 16, 2009 and in this Advisory Action mailed February 3, 2010, and therefore impliedly entered the Declaration.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.:	10/543,019	Conf. No. 3950
Filed:	December 22, 2005	
For:	Method of Manufacturing Polyolefin-Polyamide Resin Composition	
Inventors:	Kawaguchi et al.	
Art Unit:	1791	
Atty Ref:	501/43589/102-PCT-US	

DECLARATION OF NORISHIGE KAWAGUCHI

1. My name is Norishige Kawaguchi. At the time of the filing of patent application No. PCT/JP2004/016577, I was the leader of the Synthetic Rubber Technical Group in the Chiba Petrochemical Factory of Ube Industries. I am now retired but I still work for Ube Industries as a short-term contract employee. I am one of the inventors of this patent application.

2. I am also a named inventor in United States Patent No. 4,579,920, *Polybutadiene having high 1,2 and cis-1,4 microstructure contents*.

3. In the method described in the patent application, the temperature range of the melting point of the polyamide is critical.

4. For example, the lower limit of the melting point of the polyamide is 160 °C, because the melting and kneading must be performed at a temperature 20 °C higher than the melting point of the polyamide. We have found that if the melting and kneading step is performed at a temperature lower than the melting point of the polyamide, the material cannot be kneaded and disbursed in the form of fiber. Because an antioxidant is used in the second step of the method to prevent high-temperature deterioration of the polyamide, and the antioxidant has a

melting point with a lower limit of 180 °C, it is critical that the polyamide have a melting point with a lower limit that is 20 °C lower than 180 °C, or 160 °C.

5. In order to turn the polyamide into a fine fiber, the extruding step must be implemented at a temperature higher than the melting point of the polyamide, most preferably a temperature 30 °C higher. The melting and kneading step cannot occur at a temperature higher than about 295 °C without scorching and thermal decomposition of the polyolefin. Accordingly, the upper limit of the melting point of the polyamide must be 265 °C, which is 30 °C less than 295 °C.

6. Please note that if a polyamide with a melting point of, for example, 300 °C is used, the melting and kneading step must be undertaken at 330 °C. At 330 °C, there will be thermal deterioration of the polyolefin and scorching and contamination. Accordingly, the upper limit of 265 °C is critical.

7. Prevention of thermal deterioration of the polyolefin and prevention of scorching and contamination are important for productivity and longer operating time for the equipment. Using a polyamide with a melting point range out of the range of about 160 to 265 °C will decrease productivity and decrease operating time. If the material scorches, the operator must stop the equipment to clean the extruder. Downtime to the equipment means less productivity.

8. Because of these considerations, it is critical that the melting point of the polyamide fall within about 160 to 265 °C. Keeping the melting point range within the two cited temperatures has a synergistic effect, because of (a) improved disbursement of the material in the form of fiber, and (b) improved productivity and increased operating time.

9. The selection of a first antioxidant with a melting point in the range of 70 to 170 °C, a second antioxidant with a melting point in the range of 180 to 300 °C, and a polyamide with a melting point in the range of 160 to 265 °C, produces the following unexpected and synergistic effects in the manufacture of polyolefin-polyamide resins:

a. Ability to knead and disburse the polyamide in the form of fiber;

b. Preventing high-temperature deterioration of the polyamide;

c. Preventing scorching and thermal decomposition of the polyolefin; and

d. Enabling longer operating time, and therefore increased productivity, by avoiding stopping to dismantle the extruder in order to clean and remove scorches.

10. The selection of materials to make a polyolefin-polyamide resin is not predictable. A person of skill in the art of manufacturing polyolefin-polyamide resins would not look at the various materials identified in United States Patent No. 5,424,104 to Amimoto and be able to predict the effect those antioxidants would have on the manufacturing process. A person of skill in the art of manufacturing polyolefin-polyamide resins would not look at the various materials identified in JP 09-059431 to Yamamoto and be able to predict the effect those materials would have on the manufacturing process.

11. A person of skill in the art of polyolefin-polyamide resin would not be able to look at the materials identified in United States Patent No. 5,424,104 to Amimoto or in JP 09-059431 to Yamamoto and expect the selection of materials from those references to produce the synergistic and unexpected results described above.

12. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were

made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: March 23, 2009 Norishige Kawaguchi
[signature]

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IX. RELATED PROCEEDINGS APPENDIX

There are no related proceedings.

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